

SUSPENSION

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ALIGNMENT

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DESCRIPTION AND OPERATION

WHEEL ALIGNMENT

DESCRIPTION

Wheel alignment involves the correct positioning of the wheels in relation to the vehicle. The positioning is accomplished through suspension and steering linkage adjustments. An alignment is considered essential for efficient steering, good directional stability and to minimize tire wear. The most important measurements of an alignment are caster, camber and toe (Fig. 1).

CAUTION: Never attempt to modify suspension or steering components by heating or bending.

NOTE: Periodic lubrication of the front suspension/steering system components may be required. Rubber bushings must never be lubricated. Refer to Group 0, Lubrication And Maintenance for the recommended maintenance schedule.

OPERATION

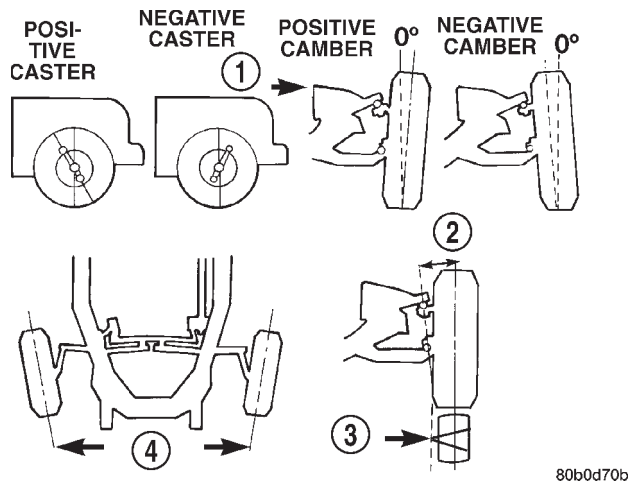
- **CASTER** is the forward or rearward tilt of the steering knuckle from vertical. Tilting the top of the knuckle forward provides negative caster. Tilting the top of the knuckle rearward provides positive caster. Positive caster promotes directional stability. This angle enables the front wheels to return to a straight ahead position after turns.

- **CAMBER** is the inward or outward tilt of the wheel relative to the center of the vehicle. Tilting the top of the wheel inward provides negative camber. Tilting the top of the wheel outward provides positive camber. Incorrect camber will cause wear on the inside or outside edge of the tire.

- **TOE** is the difference between the leading inside edges and trailing inside edges of the front tires. Wheel toe position out of specification cause's unstable steering, uneven tire wear and steering wheel off- center. The wheel toe position is the **final** front wheel alignment adjustment.

- **THRUST ANGLE** is the angle of the rear axle relative to the centerline of the vehicle. Incorrect thrust angle can cause off-center steering and excessive tire wear. This angle is not adjustable, damaged component(s) must be replaced to correct the thrust angle.

DESCRIPTION AND OPERATION (Continued)

**Fig. 1 Wheel Alignment Measurements**

- 1 - FRONT OF VEHICLE
- 2 - STEERING AXIS INCLINATION
- 3 - PIVOT POINT
- 4 - TOE-IN

DIAGNOSIS AND TESTING

PRE-ALIGNMENT INSPECTION

Before starting wheel alignment, the following inspection and necessary corrections must be completed. Refer to Suspension and Steering System Diagnosis Chart for additional information.

- (1) Inspect tires for size, air pressure and tread wear.
- (2) Inspect front wheel bearings for wear.
- (3) Inspect front wheels for excessive radial or lateral runout and balance.
- (4) Inspect ball studs, linkage pivot points and steering gear for looseness, roughness or binding.
- (5) Inspect suspension components for wear and noise.
- (6) On 4x4 vehicles check suspension height.
- (7) Road test the vehicle.

SUSPENSION AND STEERING SYSTEM DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	<ul style="list-style-type: none"> 1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Lower ball joint (4x4). 	<ul style="list-style-type: none"> 1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Grease joint and perform diagnosis and testing.
EXCESSIVE PLAY IN STEERING	<ul style="list-style-type: none"> 1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Loose or worn steering gear. 	<ul style="list-style-type: none"> 1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Adjust or replace steering gear.
FRONT WHEELS SHIMMY	<ul style="list-style-type: none"> 1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Tires worn or out of balance. 4. Alignment. 	<ul style="list-style-type: none"> 1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Replace or balance tires. 4. Align vehicle to specifications.
VEHICLE INSTABILITY	<ul style="list-style-type: none"> 1. Loose or worn wheel bearing. 2. Loose or worn steering or suspension components. 3. Tire pressure. 4. Alignment. 	<ul style="list-style-type: none"> 1. Replace wheel bearing. 2. Tighten or replace components as necessary. 3. Adjust tire pressure. 4. Align vehicle to specifications.

DIAGNOSIS AND TESTING (Continued)

CONDITION	POSSIBLE CAUSES	CORRECTION
EXCESSIVE STEERING EFFORT	<ol style="list-style-type: none"> 1. Loose or worn steering gear. 2. Column coupler binding. 3. Tire pressure. 4. Alignment. 	<ol style="list-style-type: none"> 1. Adjust or replace steering gear. 2. Replace coupler. 3. Adjust tire pressure. 4. Align vehicle to specifications.
VEHICLE PULLS TO ONE SIDE	<ol style="list-style-type: none"> 1. Tire pressure. 2. Alignment. 3. Loose or worn steering or suspension components. 4. Radial tire lead. 5. Brake pull. 6. Weak or broken spring. 7. Ride height 4WD only. 	<ol style="list-style-type: none"> 1. Adjust tire pressure. 2. Align vehicle to specifications. 3. Tighten or replace components as necessary. 4. Rotate or replace tire as necessary. 5. Repair brake as necessary. 6. Replace spring. 7. Measure and adjust ride height.

SERVICE PROCEDURES

SUSPENSION HEIGHT- 4x4

The vehicle suspension height must be measured and adjusted if necessary before performing wheel alignment on a 4x4 vehicle. Also when front suspension components have been replaced. This measure must be performed with the vehicle supporting its own weight and taken on both sides of the vehicle.

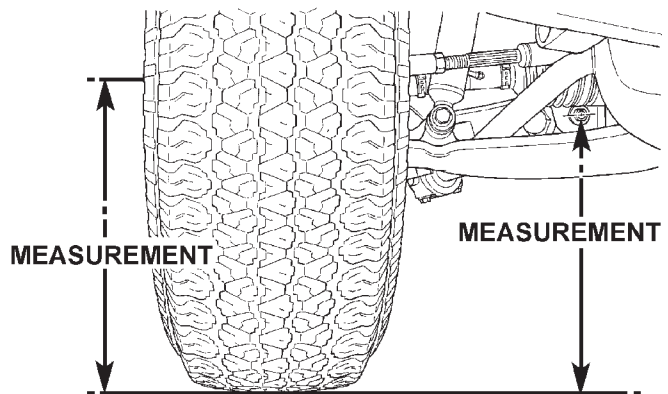
HEIGHT MEASUREMENT

- (1) Inspect tires for the correct size and air pressure.
- (2) Jounce the front of the vehicle.
- (3) Measure and record the distance between the ground and the center of the lower suspension arm rear mounting bolt head (Fig. 2).
- (4) Measure and record the distance between the ground and the center of the front wheel (Fig. 2).
- (5) Subtract the first measurement from the second measurement. The difference between the two measurements should be 47 mm (1.85 inches) \pm 3.25 mm (0.125 inches).

HEIGHT ADJUSTMENT

To adjust the vehicle height turn the torsion bar adjustment bolt **CLOCKWISE** to raise the vehicle and **COUNTER CLOCKWISE** to lower the vehicle.

CAUTION: ALWAYS raise the vehicle to the correct suspension height, NEVER lower the vehicle to obtain the correct suspension height. If the vehicle suspension height is too high, lower the vehicle



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Fig. 2 Height Measurement

below the height specification. Then raise the vehicle to the correct suspension height specification. This will insure the vehicle maintains the proper suspension height.

NOTE: If a height adjustment has been made, perform height measurement again on both sides of the vehicle.

SERVICE PROCEDURES (Continued)

WHEEL ALIGNMENT

NOTE: 4x4 suspension height measurement must be performed before alignment.

CAMBER AND CASTER ADJUSTMENT

Camber and caster angle adjustments involve changing the position of the upper suspension arm pivot bar (Fig. 3).

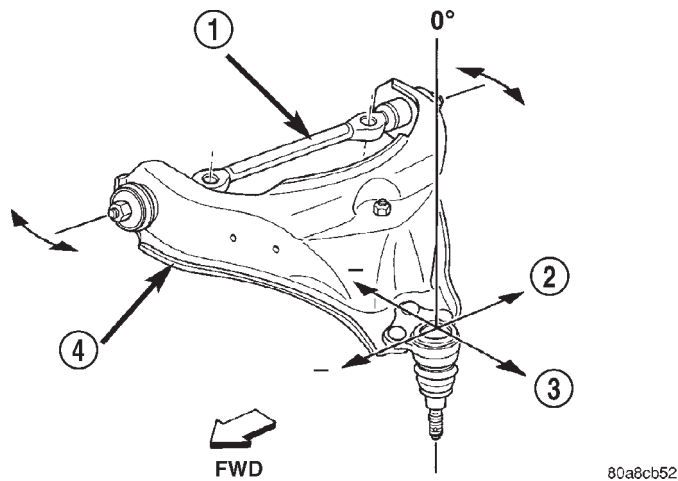


Fig. 3 Caster & Camber Adjustment-Typical

- 1 - PIVOT BAR
- 2 - + CASTER
- 3 - + CAMBER
- 4 - UPPER ARM SUSPENSION

NOTE: On 4x2 vehicles use Alignment Tool 8393 for alignment. The tool attaches to the pivot bar on the upper control arm.

CASTER

Moving the rear position of the pivot bar in or out, will change the caster angle significantly and camber angle only slightly. To maintain the camber angle while adjusting caster, move the rear of the pivot bar in or out. Then move the front of the pivot bar slightly in the opposite direction.

For example, to increase a positive caster angle, move the rear position of the pivot bar inward (toward the engine). Move the front of pivot bar outward (away from the engine) slightly until the original camber angle is obtained.

CAMBER

Move the front of the pivot bar in or out. This will change the camber angle significantly and caster angle slightly.

After adjustment is made tighten the pivot bar nuts to proper torque specification.

TOE ADJUSTMENT

The wheel toe position adjustment is the final adjustment.

(1) Start the engine and turn wheels both ways before straightening the wheels. Secure the steering wheel with the front wheels in the straight-ahead position.

(2) Loosen the tie rod jam nuts.

NOTE: Each front wheel should be adjusted for one-half of the total toe position specification. This will ensure the steering wheel will be centered when the wheels are positioned straight-ahead.

(3) Adjust the wheel toe position by turning the tie rod as necessary (Fig. 4).

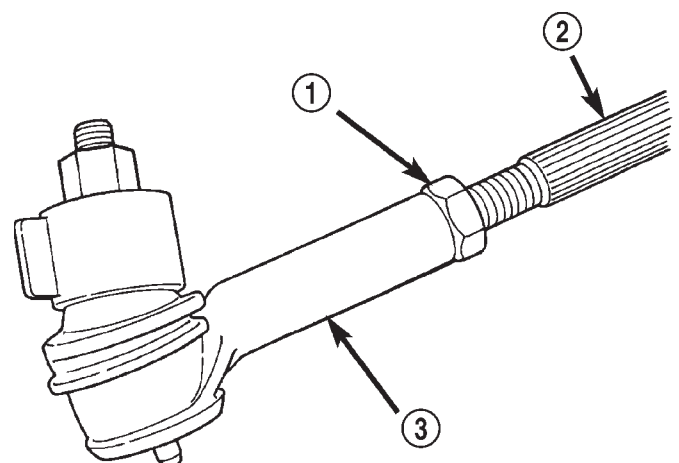


Fig. 4 Toe Adjustment

- 1 - JAM NUT
- 2 - TIE ROD
- 3 - TIE ROD END

(4) Tighten the tie rod jam nut to 75 N-m (55 ft. lbs.).

(5) Verify the specifications.

(6) Turn off engine.

SPECIFICATIONS

ALIGNMENT

VEHICLE	WHEEL BASE	CASTER ($\pm 0.50^\circ$)	CAMBER ($\pm 0.50^\circ$)	TOTAL TOE ($\pm 0.06^\circ$)
4x2	111.9	2.99°	-0.25°	0.10°
	130.9	3.13°	-0.25°	0.10°
4x4	111.9	3.16°	-0.25°	0.10°
	130.9	3.27°	-0.25°	0.10°
MAXIMUM RT to LT DIFFERENCE		0.50°	0.50°	0.06

DAKOTA RT

VEHICLE	WHEEL BASE	CASTER ($\pm 0.50^\circ$)	CAMBER ($\pm 0.50^\circ$)	TOTAL TOE ($\pm 0.06^\circ$)
4x2	111.9	3.67°	-0.34°	0.10°
	130.9	3.81°	-0.34°	0.10°
MAXIMUM RT to LT DIFFERENCE		0.50°	0.50°	0.06

NOTE: All alignment specifications are in degrees.

FRONT SUSPENSION - 4x2

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DESCRIPTION AND OPERATION

FRONT SUSPENSION - 4X2

DESCRIPTION

The front suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub bearings on the cast iron steering knuckle spindles. The double-row hub bearings are sealed and lubricated for life. The steering knuckles turn (pivot) on ball joints riveted to the outboard portion of the suspension arms. The ball joints are lubricated for life.

The 4x2 front suspension is comprised of (Fig. 1) :

CAUTION: Components attached with a nut and cotter pin must be torqued to specification. Then if the slot in the nut does not line up with the cotter pin hole, tighten nut until it is aligned. Never loosen the nut to align the cotter pin hole.

CAUTION: Suspension components with rubber/urethane bushings (except stabilizer bar) should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

- Shock absorbers
- Coil springs
- Suspension arms
- Stabilizer bar

- Jounce/Rebound Bumpers
- Steering Knuckle

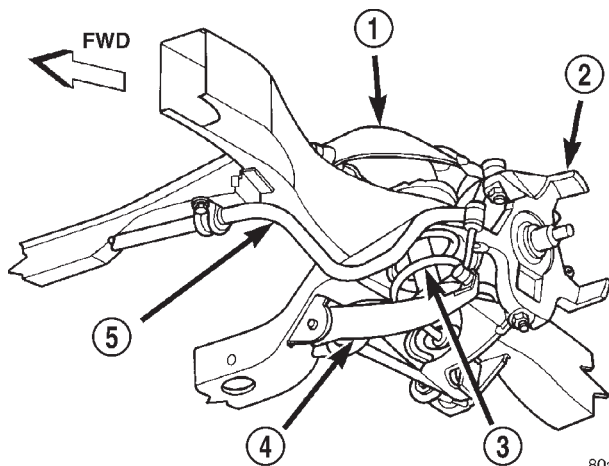


Fig. 1 Front Suspension - 4X2

- 1 - UPPER SUSPENSION ARM
- 2 - STEERING KNUCKLE
- 3 - COIL SPRING
- 4 - LOWER SUSPENSION ARM
- 5 - STABILIZER BAR

SHOCK ABSORBERS

DESCRIPTION

The top of the low-pressure gas charged shock are bolted to the frame. The bottom of the shock are bolted to the lower suspension arm.

OPERATION

The shock absorbers dampen jounce and rebound of the vehicle over various road conditions.

DESCRIPTION AND OPERATION (Continued)

COIL SPRINGS

DESCRIPTION

The springs mount between the lower suspension arms and frame rail spring seats. A rubber isolator seats on top off the spring to help prevent noise.

OPERATION

The coil springs control ride quality and maintain proper ride height.

STEERING KNUCKLE

DESCRIPTION

The knuckle is a single casting with legs machined for the upper and lower ball joints. The knuckle also has machined mounting locations for the front brake calipers and hub bearing.

OPERATION

The steering knuckle pivot between the upper and lower ball joint. Steering linkage attached to the knuckle allows the vehicle to be steered.

SUSPENSION ARMS

DESCRIPTION

The upper suspension arm bolts on frame brackets through the arm pivot shaft. The frame brackets have slotted holes which allow the arms to be adjusted for caster and camber. Pivot shaft bushings are not replaceable.

The lower suspension arms bolt to the lower frame brackets and pivot through bushings, these bushings are not replaceable.

The suspension arms have lube for life riveted ball studs. The suspension arm travel (jounce) is limited through the use of urethane bumpers. Rebound travel is limited by the shock absorber.

STABILIZER BAR

DESCRIPTION

The bar extends across the front underside of the chassis and mounts on the frame rails. Links connected the bar to the lower suspension arms. Stabilizer bar mounts are isolated by rubber bushings. Links are isolated with rubber grommets.

OPERATION

The stabilizer bar is used to minimize vehicle front sway during turns. The spring steel bar helps to control the vehicle body in relationship to the suspension.

DIAGNOSIS AND TESTING

LOWER BALL JOINT

(1) Raise the front of the vehicle. Place safety floor stands under both lower suspension arms as far outboard as possible. Lower the vehicle to allow the stands to support some or all of the vehicle weight.

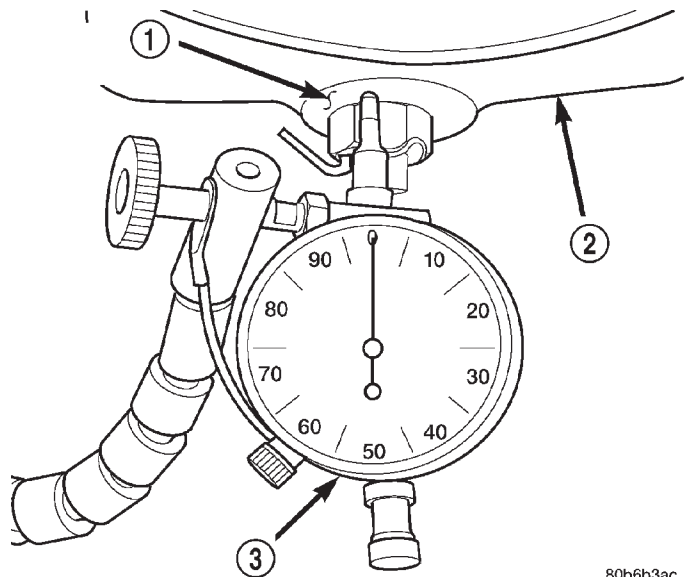
NOTE: The upper suspension arms must not contact the rebound bumpers.

(2) Remove the tire and wheel assemblies.

(3) Mount a dial indicator solidly under the lower suspension arm.

(4) Position indicator plunger against the bottom of the steering knuckle lower ball joint boss.

NOTE: The dial indicator plunger must be perpendicular to the machined surface of the steering knuckle lower ball joint boss (Fig. 2).



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Fig. 2 Lower Ball Joint Boss

- 1 - BALL JOINT BOSS
- 2 - STEERING KNUCKLE
- 3 - DIAL INDICATOR

(5) Position a pry bar over the top of the upper suspension arm and under the pivot bar of the upper suspension arm. Pry down on the upper suspension arm and then zero the dial indicator.

(6) Reposition the pry bar under the upper suspension arm and on top of the frame rail. Pry up on the upper suspension arm and record the dial indicator reading.

(7) If the travel exceeds 1.52 mm (0.060 in.), replace the lower suspension arm.

DIAGNOSIS AND TESTING (Continued)

UPPER BALL JOINT

(1) Position a floor jack under the lower suspension arm. Raise the wheel and allow the tire to lightly contact the floor (vehicle weight relieved from the tire).

(2) Mount a dial indicator solidly on the upper suspension arm.

(3) Position the indicator plunger against the upper ball joint boss of the steering knuckle.

(4) Grasp the top of the tire and apply force in and out. Look for movement at the ball joint between the upper suspension arm and steering knuckle.

(5) If lateral movement is greater than 1.52 mm (0.060 in.), replace upper suspension arm.

SHOCK DIAGNOSIS

A knocking or rattling noise from a shock absorber may be caused by movement between mounting bushings and metal brackets or attaching components. These noises can usually be stopped by tightening the attaching nuts. If the noise persists, inspect for damaged and worn bushings, and attaching components. Repair as necessary if any of these conditions exist.

A squeaking noise from the shock absorber may be caused by the hydraulic valving and may be intermittent. This condition is not repairable and the shock absorber must be replaced.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

The shock absorber bushings do not require any type of lubrication. Do not attempt to stop bushing noise by lubricating them. Grease and mineral oil-base lubricants will deteriorate the bushing.

REMOVAL AND INSTALLATION

SHOCK ABSORBER

REMOVAL

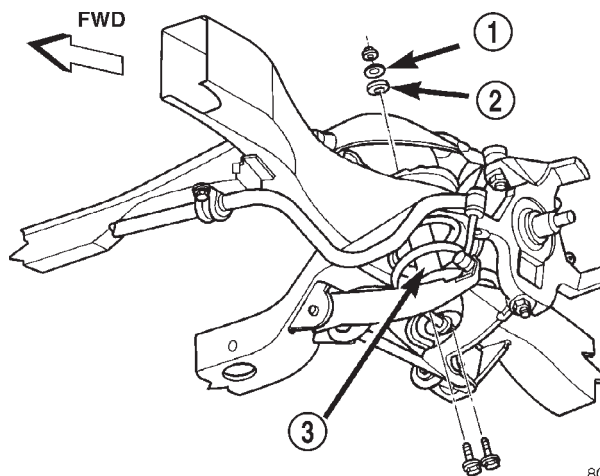
(1) Remove the upper shock nut, retainer and grommet from the shock absorber stud (Fig. 3).

(2) Raise and support the vehicle.

(3) Remove the lower mounting bolts and remove shock absorber through the lower suspension arm (Fig. 3).

INSTALLATION

NOTE: Upper shock nut must be replaced or use Mopar Lock 'N Seal or Loctite® 242 on existing nut.



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Fig. 3 Front Shock Absorber

- 1 - RETAINER
- 2 - GROMMET
- 3 - SHOCK ABSORBER

(1) Install the lower retainer (**lower retainer is stamped with a L**) and grommet on the shock absorber stud and extend the shock. Insert the shock absorber through the lower suspension arm and upper mounting hole.

(2) Install the lower mounting bolts and tighten to 28 N·m (21 ft. lbs.).

(3) Remove support and lower the vehicle.

(4) Install the upper grommet and retainer (**upper retainer is stamped with a U**) on the shock absorber stud. Install a new nut or use Mopar Lock 'N Seal or Loctite® 242 on existing nut and tighten to 26 N·m (19 ft. lbs.).

COIL SPRING

REMOVAL

(1) Raise and support the vehicle.

(2) Remove wheel and tire assembly.

(3) Remove the stabilizer bar link from the lower suspension arm.

(4) Remove the shock absorber.

(5) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring and upper shock mounting hole (Fig. 4).

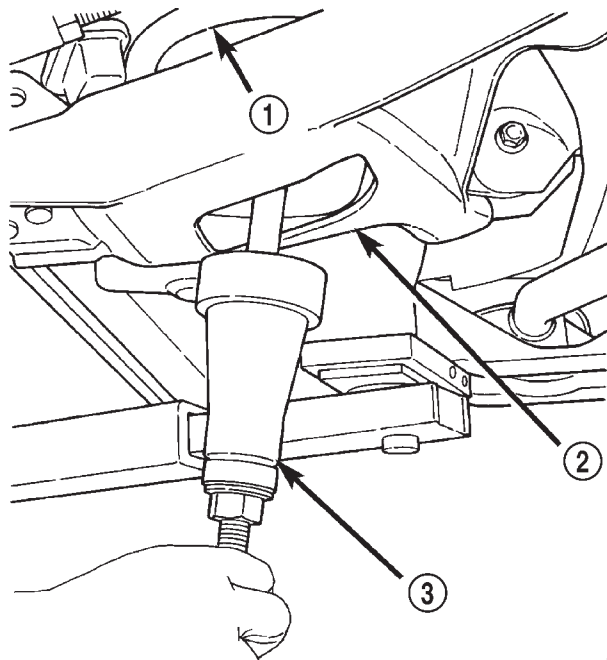
(6) Tighten the tool lower nut to compress the coil spring.

(7) Remove the lower ball joint nut and separate the ball joint from the knuckle with Remover C-4150A (Fig. 5).

(8) Loosen the spring compressor lower nut to relieve spring tension.

(9) Remove the tool and pull down on the lower suspension arm to remove the spring.

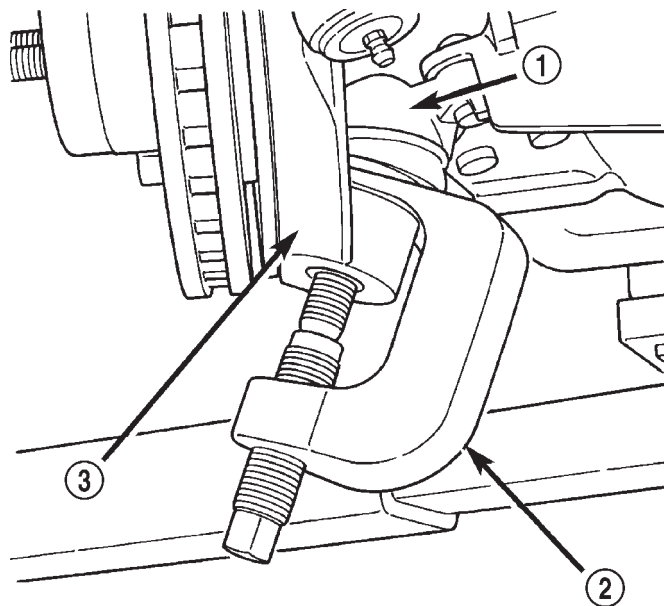
REMOVAL AND INSTALLATION (Continued)



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Fig. 4 Spring Compressor

- 1 - COIL SPRING
- 2 - LOWER SUSPENSION ARM
- 3 - SPRING COMPRESSOR



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Fig. 5 Lower Ball Joint

- 1 - LOWER BALL JOINT
- 2 - REMOVER
- 3 - STEERING KNUCKLE

INSTALLATION

NOTE: The ramped or open end of the coil spring is the bottom of the spring.

- (1) Tape the isolator pad to the top of the coil spring. Position the spring in the lower suspension arm pocket. Be sure that the coil spring is seated in the pocket.
- (2) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring upper shock mounting hole.
- (3) Tighten the tool nut to compress the coil spring.
- (4) Install the lower ball joint into the knuckle and tighten the nut to 127 N·m (94 ft. lbs.). Install cotter pin.
- (5) Remove the spring compressor tool.
- (6) Install the stabilizer bar link to the lower suspension arm and tighten nut to 47 N·m (35 ft. lbs.).
- (7) Install the shock absorber.
- (8) Install the wheel and tire assembly.
- (9) Remove support and lower the vehicle.

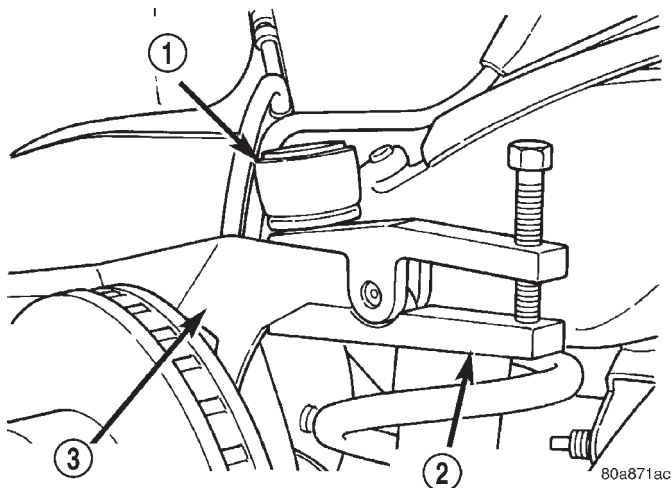
STEERING KNUCKLE**REMOVAL**

- (1) Raise and support the vehicle.
- (2) Remove the wheel and tire assembly.
- (3) Remove disc brake caliper, rotor, shield and ABS speed sensor, refer to Group 5 Brakes.
- (4) Remove tie-rod from steering knuckle arm, refer to Group 19 Steering.
- (5) Remove the hub/bearing.
- (6) Remove the shock absorber.
- (7) Install Spring Compressor DD-1278 up through the lower suspension arm, coil spring and upper shock mounting hole (Fig. 4).
- (8) Tighten the tool lower nut to compress the coil spring.
- (9) Remove the lower ball joint nut and separate the ball joint from the knuckle with Remover C-4150A (Fig. 5).
- (10) Remove the upper ball joint nut and separate the ball joint from the knuckle with Remover MB-991113 (Fig. 6).

CAUTION: When install Remover MB-991113 to separate the ball joint, be careful not to damage the ball joint seal.

- (11) Remove steering knuckle.

REMOVAL AND INSTALLATION (Continued)

**Fig. 6 Upper Ball Joint**

- 1 - UPPER BALL JOINT
2 - REMOVER
3 - KNUCKLE

INSTALLATION

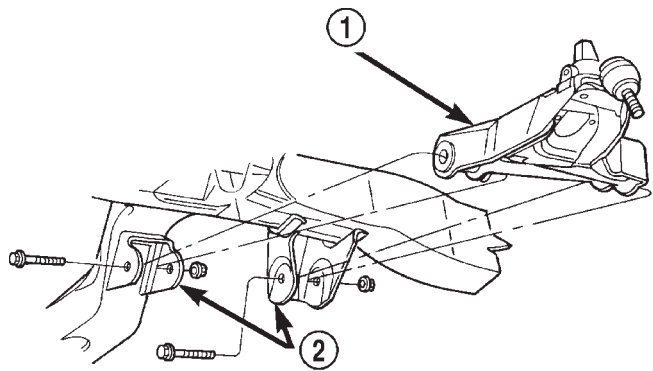
- (1) Position steering knuckle on upper and lower ball joints and install nuts. Tighten lower nut to 127 N·m (94 ft. lbs.). Tighten upper nut to 81 N·m (60 ft. lbs.) and install new cotter pins.
- (2) Remove the spring compressor.
- (3) Install the shock absorber.
- (4) Install the hub/bearing.
- (5) Install ABS speed sensor, brake dust shield, rotor and caliper, refer to Group 5 Brakes.
- (6) Install tie rod to steering knuckle arm, refer to Group 19 Steering.
- (7) Install the wheel and tire assembly.
- (8) Remove support and lower the vehicle

LOWER SUSPENSION ARM**REMOVAL**

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove disc brake caliper and rotor from steering knuckle, refer to Group 5 Brakes.
- (4) Remove shock absorber.
- (5) Remove stabilizer bar link from the lower suspension arm.
- (6) Remove the coil spring.
- (7) Remove lower suspension arm mounting bolts (Fig. 7) from the frame mounts and remove the arm.

INSTALLATION

CAUTION: Frame mounting bolts must be installed to their original location and orientation to avoid damaging the steering rack boots.

**Fig. 7 Lower Suspension Arm**

- 1 - LOWER SUSPENSION ARM
2 - FRAME MOUNTS

- (1) Loosely attach suspension arm to frame mounts.
- (2) Install the coil spring.
- (3) Install the shock absorber.
- (4) Install stabilizer bar link to the lower suspension arm and tighten nut to 47 N·m (35 ft. lbs.)
- (5) Install brake rotor and caliper, refer to Group 5 Brakes.
- (6) Install wheel and tire assembly.
- (7) Remove support and lower the vehicle.
- (8) Tighten the front suspension arm mounting nut to 175 N·m (130 ft. lbs.) and the rear nut to 108 N·m (80 ft. lbs.).

UPPER SUSPENSION ARM**REMOVAL**

- (1) Raise and support the vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake hose bracket from the arm.
- (4) Position a hydraulic jack under the arm and raise the jack to unload the rebound bumper.
- (5) Remove cotter pin and nut from upper ball joint.
- (6) Separate upper ball joint from steering knuckle with Remover MB-991113 (Fig. 6).

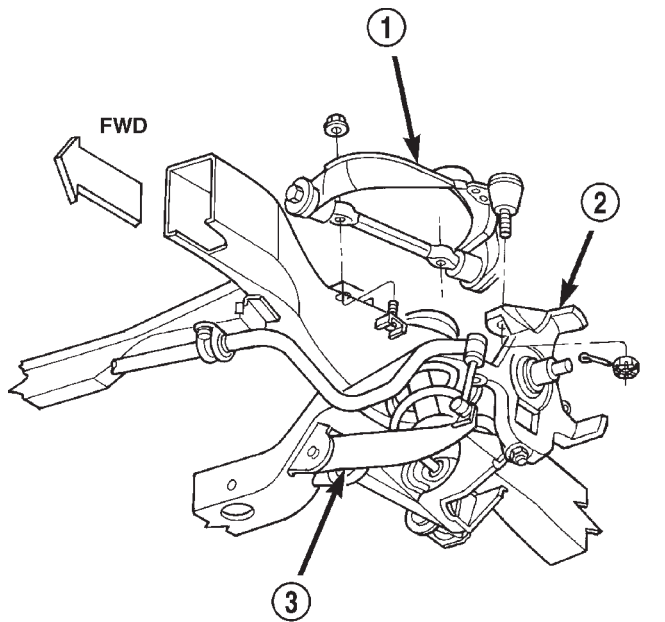
CAUTION: When installing Remover MB-991113 to separate the ball joint, be careful not to damage the ball joint seal.

- (7) Remove suspension arm pivot bar mounting nuts and remove suspension arm (Fig. 8).

INSTALLATION

NOTE: Before installation, insure pivot bar adjustment bolts are in their original location (Fig. 8).

REMOVAL AND INSTALLATION (Continued)



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Fig. 8 Upper Suspension Arm

- 1 - UPPER SUSPENSION ARM
- 2 - STEERING KNUCKLE
- 3 - LOWER SUSPENSION ARM

(1) Position suspension arm pivot bar on adjustment bolts. Install nuts and tighten to 210 N·m (155 ft. lbs.).

(2) Position steering knuckle on upper ball joint. Tighten the upper ball joint nut to 81 N·m (60 ft. lbs.) and install a new cotter pin.

(3) Install the wheel and tire assembly.

(4) Remove support and lower vehicle.

(5) Align front end to specifications.

STABILIZER BAR**REMOVAL**

(1) Raise and support the vehicle.

(2) Remove the upper link nut, retainer and grommet from each link.

(3) Remove the lower link nut from the lower suspension arm on each side (Fig. 9).

(4) Remove the stabilizer bar retainer bolts and remove the retainers and stabilizer bar from the vehicle.

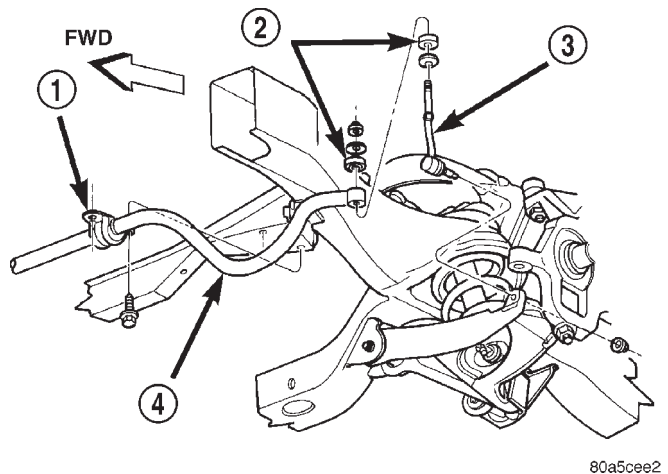
(5) Remove the bushings from the stabilizer bar.

INSTALLATION

(1) Install the bushings on the stabilizer bar.

(2) Install the stabilizer bar on the frame and install the retainers and the bolts.

(3) Tighten the bolts to 60 N·m (45 ft. lbs.).



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Fig. 9 Stabilizer Bar

- 1 - RETAINER
- 2 - GROMMET
- 3 - STABILIZER LINK
- 4 - STABILIZER BAR

NOTE: Ensure the bar is center with equal spacing on both sides.

(4) Install the link lower retainer and grommet on the links.

(5) Install the links into the stabilizer bar and lower suspension arm on each side.

(6) Install the lower link mounting nut and tighten to 47 N·m (35 ft. lbs.).

NOTE: Ensure both link end caps are facing straight forward.

(7) Install the upper link grommet, retainer and nut and tighten to 37 N·m (27 ft. lbs.).

(8) Remove support and lower vehicle.

HUB/BEARING**REMOVAL**

(1) Raise and support vehicle.

(2) Remove wheel and tire assembly.

(3) Remove brake caliper, rotor, and ABS wheel speed sensor if equipped, refer to Group 5 Brakes.

(4) Remove hub/bearing spindle nut and discard nut (Fig. 10).

CAUTION: The hub/bearing spindle nut can not be re-used.

(5) Slide hub/bearing off spindle.

INSTALLATION

(1) Slide hub/bearing on spindle.

REMOVAL AND INSTALLATION (Continued)

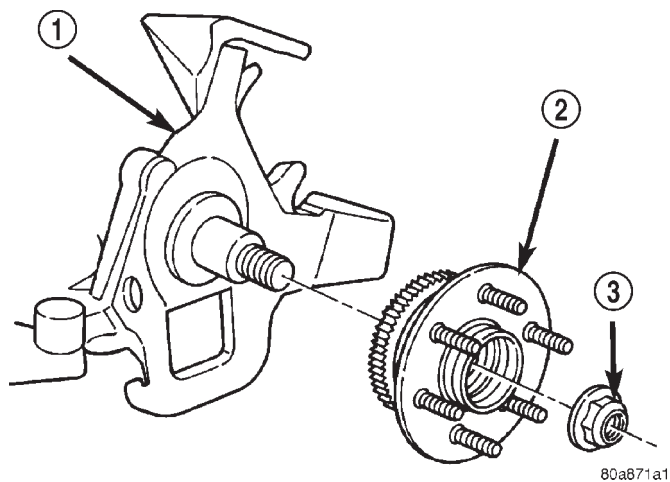


Fig. 10 Hub/Bearing

- 1 - KNUCKLE
- 2 - HUB/BEARING
- 3 - SPINDLE NUT

- (2) Install **new** spindle nut and tighten to 251 N·m (185 ft. lbs.).
- (3) Install brake rotor, caliper, and ABS wheel speed sensor if equipped, refer to Group 5 Brakes.
- (4) Install wheel and tire assembly.
- (5) Remove support and lower vehicle.

WHEEL MOUNTING STUDS

CAUTION: Do not use a hammer to remove wheel studs.

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake caliper, caliper adapter and rotor, refer to Group 5 Brakes for procedure.
- (4) Remove stud from hub with Remover C-4150A (Fig. 11).

INSTALLATION

- (1) Install new stud into hub flange.
- (2) Install three washers onto stud, then install lug nut with the flat side of the nut against the washers.
- (3) Tighten lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.
- (4) Remove lug nut and washers.
- (5) Install the brake rotor, caliper adapter, and caliper, refer to Group 5 Brakes for procedure.
- (6) Install wheel and tire assembly, use new lug nut on stud or studs that were replaced.
- (7) Remove support and lower vehicle.

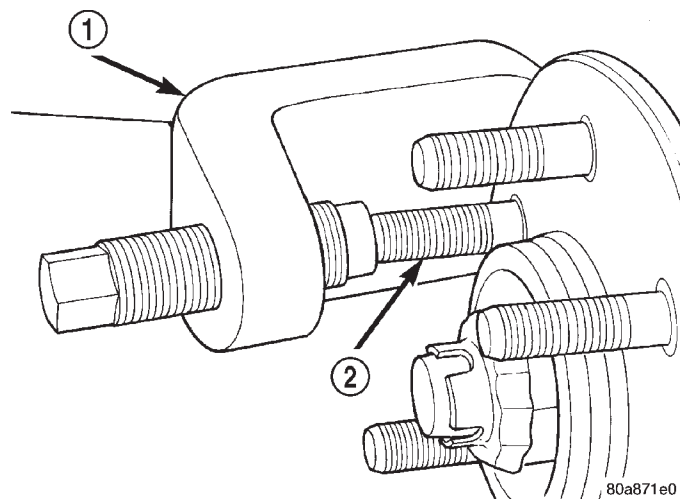


Fig. 11 Wheel Stud Removal

- 1 - REMOVER
- 2 - WHEEL STUD

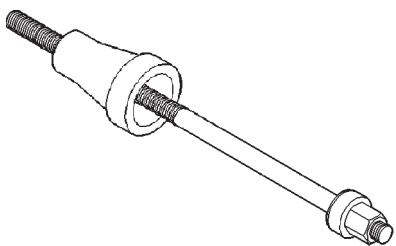
SPECIFICATIONS

TORQUE CHART

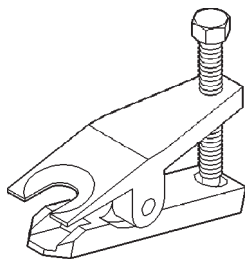
DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	26 N·m (19 ft. lbs.)
Lower Bolts	28 N·m (21 ft. lbs.)
Lower Suspension Arm	
Front Nut	175 N·m (130 ft. lbs.)
Rear Nut	108 N·m (80 ft. lbs.)
Ball Joint Nut	127 N·m (94 ft. lbs.)
Upper Suspension Arm	
Pivot Shaft Nuts	167 N·m (130 ft. lbs.)
Pivot Shaft to Frame Nuts	210 N·m (155 ft. lbs.)
Ball Joint Nut	81 N·m (60 ft. lbs.)
Stabilizer Bar	
Link Upper Nut	37 N·m (27 ft. lbs.)
Link Ball Stud Nut	47 N·m (35 ft. lbs.)
Retainer Bolts	60 N·m (45 ft. lbs.)
Hub/Bearing	
Spindle Nut	251 N·m (185 ft. lbs.)

SPECIAL TOOLS

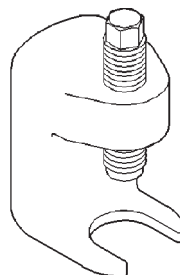
FRONT SUSPENSION



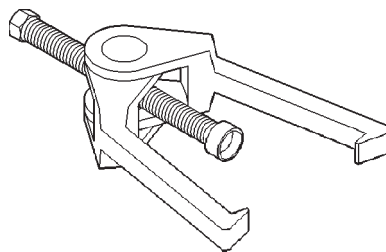
Compressor, Coil Spring DD-1278



Remover Ball Joint MB-991113



Remover Ball Joint C-4150A



Puller Tie Rod C-3894-A

FRONT SUSPENSION - 4x4

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DESCRIPTION AND OPERATION

FRONT SUSPENSION - 4x4

DESCRIPTION

The front suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub/bearings units bolted to cast steering knuckle. The double-row hub bearings are sealed and lubricated for life. The steering knuckles turn (pivot) on ball joints. The upper ball joint is riveted to the outboard portion of the suspension arm and lubricated for life. The lower ball joint is pressed into the lower suspension arm and requires lubrication.

The 4x4 front suspension is comprised of (Fig. 1) :

- Shock absorbers
- Torsion-bar springs
- Suspension arms
- Steering knuckles
- Stabilizer bar
- Jounce/Rebound bumpers

CAUTION: Components attached with a nut and cotter pin must be torqued to specification. Then if the slot in the nut does not line up with the cotter pin hole, tighten nut until it is aligned. Never loosen the nut to align the cotter pin hole.

CAUTION: Suspension components with rubber/urethane bushings (except stabilizer bar) should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If

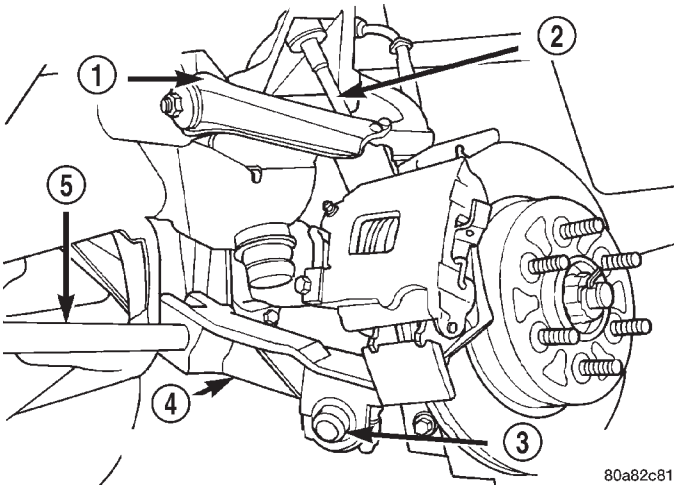


Fig. 1 Front Suspension - 4x4

- 1 – UPPER SUSPENSION ARM
- 2 – SHOCK ABSORBER
- 3 – STABILIZER BAR
- 4 – LOWER SUSPENSION ARM
- 5 – TORSION BAR

springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

SHOCK ABSORBERS

DESCRIPTION

The top of the low-pressure gas charged shock are bolted to the frame. The bottom of the shock are bolted to the lower suspension arm.

DESCRIPTION AND OPERATION (Continued)

OPERATION

The shock absorbers dampen jounce and rebound of the vehicle over various road conditions.

TORSION BARS**DESCRIPTION**

The front of the bar mounts to the back side of the lower suspension arm. The rear end of the bar is mounted in a anchor that rests in the frame cross-member.

OPERATION

The torsion bars are used to control ride height and ride quality. The vehicle height is adjusted through an anchor adjustment bolt that increases or decreases the angle of the torsion bar. Increasing or decreasing the bar angle changes the angle of the suspension arms.

STEERING KNUCKLE**DESCRIPTION**

The knuckle is a single casting with legs machined for the upper and lower ball joints. The knuckle also has machined mounting locations for the front brake calipers and hub bearing.

OPERATION

The steering knuckle pivot between the upper and lower ball joint. Steering linkage attached to the knuckle allows the vehicle to be steered.

SUSPENSION ARMS**DESCRIPTION**

The upper suspension arm bolts on frame brackets through the arm pivot shaft. The frame brackets have slotted holes which allow the arms to be adjusted for caster and camber. Pivot shaft bushings are not replaceable.

The lower suspension arms bolt to the lower frame brackets and pivot through bushings, these bushings are not replaceable.

The suspension arms have lube for life riveted ball studs. The suspension arm travel (jounce) is limited through the use of urethane bumpers. Rebound travel is limited by the shock absorber.

STABILIZER BAR**DESCRIPTION**

The bar extends across the front underside of the chassis and connects to the frame crossmember. The ends of the bar mount to the lower suspension arm.

All mounting points of the stabilizer bar are isolated by bushings.

OPERATION

The stabilizer bar is used to minimize vehicle front sway during turns. The bar helps to maintain a flat attitude to the road surface.

DIAGNOSIS AND TESTING**LOWER BALL JOINT**

NOTE: If the ball joint is equipped with a lubrication fitting, grease the joint then road test the vehicle before performing test.

(1) Raise the front of the vehicle. Place safety floor stands under both lower suspension arms as far outboard as possible. Lower the vehicle to allow the stands to support some or all of the vehicle weight.

NOTE: The upper suspension arms must not contact the rebound bumpers.

- (2) Remove the tire and wheel assemblies.
- (3) Mount a dial indicator solidly to the underside of the lower suspension arm.
- (4) Position indicator plunger against the bottom surface of the steering knuckle lower ball joint boss.

NOTE: The dial indicator plunger must be perpendicular to the machined surface of the steering knuckle lower ball joint boss (Fig. 2).

(5) Position a pry bar over the top of the upper suspension arm and under the pivot bar of the upper suspension arm. Pry down on the upper suspension arm and then zero the dial indicator.

(6) Reposition the pry bar under the upper suspension arm and on top of the jounce/rebound bracket. Pry up on the upper suspension arm and record the dial indicator reading.

(7) If the travel exceeds 1.52 mm (0.060 in.), replace the lower control arm.

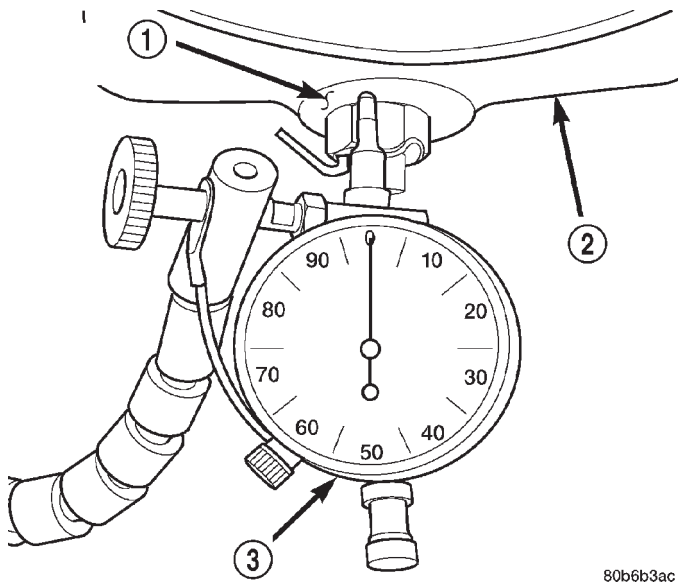
UPPER BALL JOINT

(1) Position a floor jack under the lower suspension arm. Raise the wheel and allow the tire to lightly contact the floor (vehicle weight relieved from the tire).

(2) Mount a dial indicator solidly on the upper suspension arm.

(3) Position the indicator plunger against the back side of the upper ball joint boss of the steering knuckle (Fig. 3).

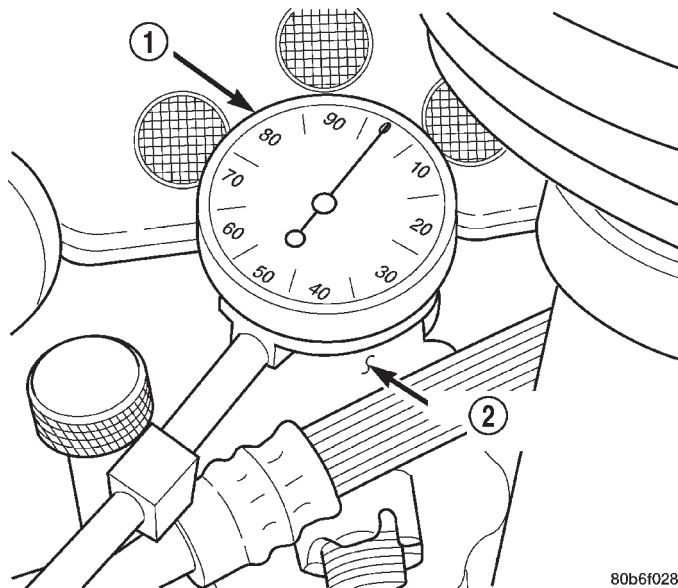
DIAGNOSIS AND TESTING (Continued)



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Fig. 2 Lower Ball Joint Boss

- 1 - BALL JOINT BOSS
- 2 - STEERING KNUCKLE
- 3 - DIAL INDICATOR



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Fig. 3 Upper Ball Joint Boss

- 1 - DIAL INDICATOR
- 2 - BALL JOINT BOSS

(4) Grasp the top of the tire and pull outward, then zero the dial indicator.

(5) Grasp the top of the tire and push inward and record the dial indicator reading.

(6) If lateral movement is greater than 1.52 mm (0.060 in.), replace upper suspension arm.

SHOCK DIAGNOSIS

A knocking or rattling noise from a shock absorber may be caused by movement between mounting bushings and metal brackets or attaching components. These noises can usually be stopped by tightening the attaching nuts. If the noise persists, inspect for damaged and worn bushings, and attaching components. Repair as necessary if any of these conditions exist.

A squeaking noise from the shock absorber may be caused by the hydraulic valving and may be intermittent. This condition is not repairable and the shock absorber must be replaced.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

The shock absorber bushings do not require any type of lubrication. Do not attempt to stop bushing noise by lubricating them. Grease and mineral oil-base lubricants will deteriorate the bushing.

SERVICE PROCEDURES**LUBRICATION**

Periodic lubrication of the suspension system may be required. Refer to Group 0, Lubrication And Maintenance for the recommended maintenance schedule.

REMOVAL AND INSTALLATION**SHOCK ABSORBER****REMOVAL**

- (1) Raise and support vehicle.
- (2) Remove the upper shock absorber nut, retainer and grommet (Fig. 4).
- (3) Remove the lower bolt and remove the shock absorber.

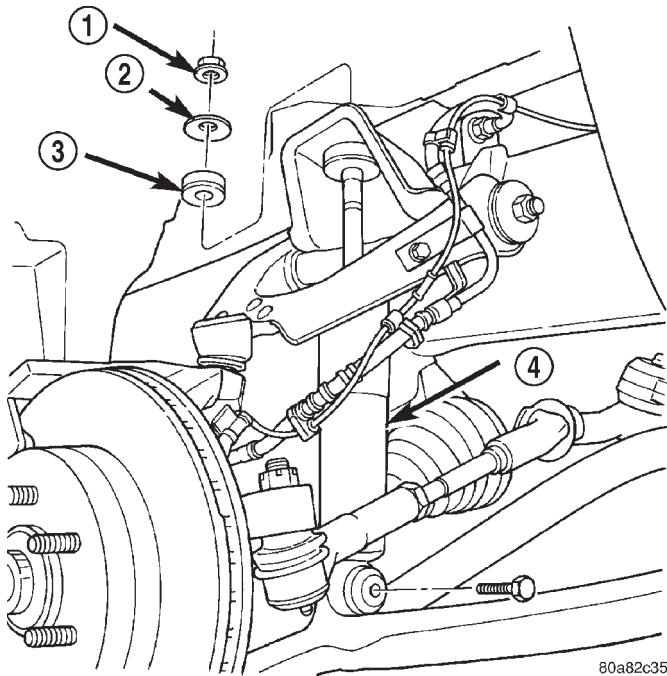
INSTALLATION

NOTE: Upper shock nut must be replaced or use Mopar Lock 'N Seal or Loctite® 242 on existing nut.

(1) Install the lower retainer (**lower retainer is stamped with a L**) and grommet on the shock absorber stud. Insert the shock absorber through the frame bracket hole.

(2) Install the lower bolt and tighten the bolt to 108 N-m (80 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

**Fig. 4 Shock Absorber**

- 1 - NUT
- 2 - RETAINER
- 3 - GROMMET
- 4 - SHOCK

(3) Install the upper grommet, retainer (**upper retainer is stamped with a U**) and new nut or use Mopar Lock 'N Seal or Loctite® 242 on existing nut, on the shock absorber stud. Tighten nut to 26 N·m (19 ft. lbs.).

TORSION BAR

CAUTION: The left and right side torsion bars are **NOT** interchangeable. The bars are identified and stamped R or L, for right or left. The bars do not have a front or rear end and can be installed with either end facing forward.

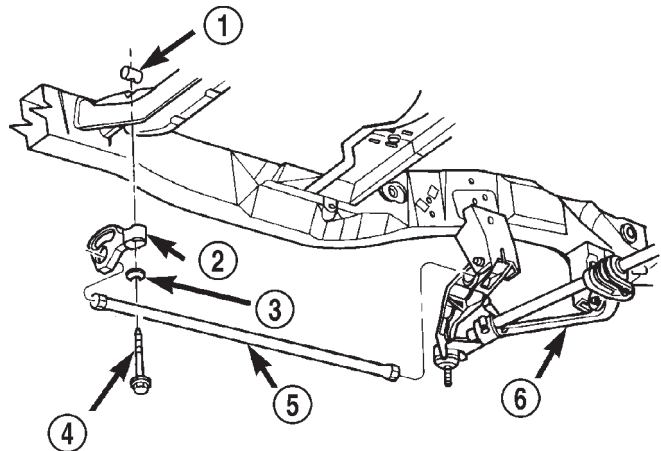
REMOVAL

- (1) Raise and support the vehicle with the front suspension hanging.
- (2) Turn the adjustment bolt counterclockwise to release spring load (Fig. 5).

NOTE: Count and record the number of turns for installation reference.

- (3) Remove the adjustment bolt from swivel.
- (4) Remove torsion bar and anchor. Remove anchor from torsion bar.
- (5) Remove all foreign material from torsion bar mounting in anchor and suspension arm.

- (6) Inspect adjustment bolt, bearing and swivel for damage.



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Fig. 5 Torsion Bar

- 1 - SWIVEL
- 2 - ANCHOR
- 3 - BEARING
- 4 - ADJUSTMENT BOLT
- 5 - TORSION BAR
- 6 - LOWER SUSPENSION ARM

INSTALLATION

- (1) Insert torsion bar ends into anchor and suspension arm.
- (2) Position anchor and bearing in frame cross-member. Install adjustment bolt through bearing, anchor and into the swivel.
- (3) Turn adjustment bolt clockwise the recorded amount of turns.
- (4) Lower vehicle and adjust the front suspension height. Refer to Suspension Height service procedure.

STEERING KNUCKLE**REMOVAL**

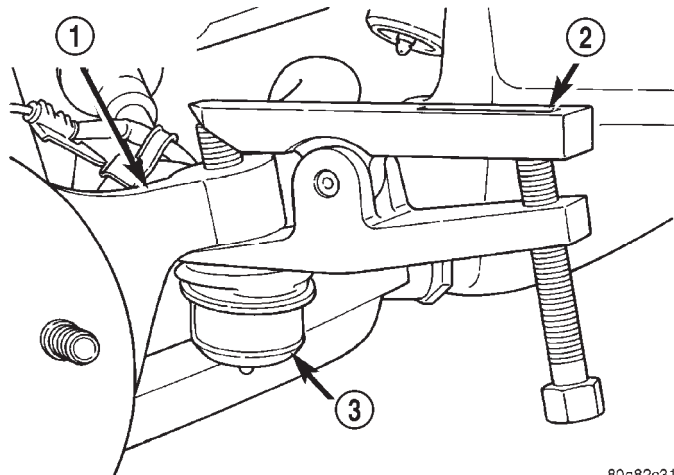
- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake caliper, rotor, shield and ABS wheel speed sensor if equipped. Refer to Group 5 Brakes.
- (4) Remove front driveshaft, refer to Group 3 Differential and Driveline.
- (5) Remove tie rod end cotter pin and nut. Separate the tie rod from the knuckle with Remover MB-991113 (Fig. 6).
- (6) Support the lower suspension arm with a hydraulic jack and raise the jack to unload the rebound bumper.
- (7) Remove the upper ball joint cotter pin and nut. Separate the ball joint from the knuckle with Remover MB-991113 (Fig. 7).

REMOVAL AND INSTALLATION (Continued)

CAUTION: When installing Remover MB-991113 to separate the ball joint, be careful not to damage the ball joint seal.

(8) Remove the lower ball joint cotter pin and nut. Separate the ball joint from the knuckle with Remover C-4150A (Fig. 8) and remove the knuckle.

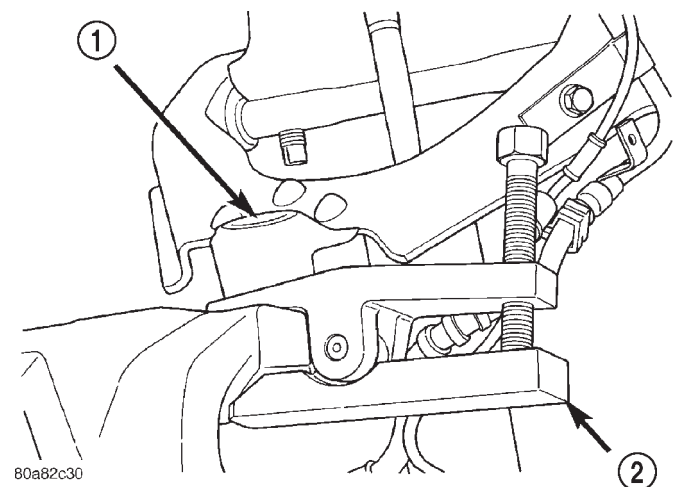
(9) Remove the hub/bearing from the steering knuckle.



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Fig. 6 Tie Rod End

- 1 - STEERING KNUCKLE
- 2 - REMOVER
- 3 - TIE ROD END



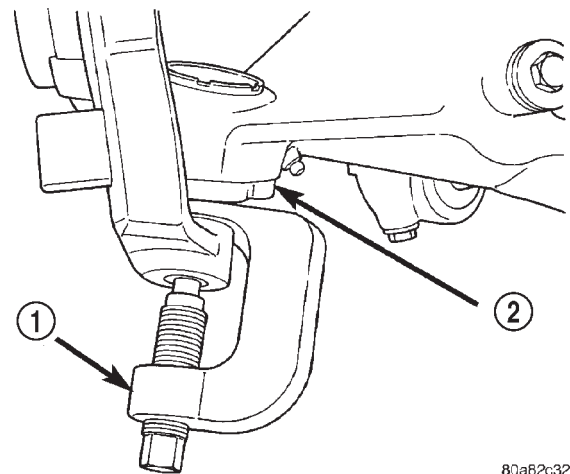
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Fig. 7 Upper Ball Joint

- 1 - UPPER BALL STUD
- 2 - REMOVER

INSTALLATION

(1) Install the hub/bearing to the steering knuckle and tighten the bolts to 166 N·m (123 ft. lbs.).



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Fig. 8 Lower Ball Joint

- 1 - REMOVER
- 2 - LOWER BALL STUD

NOTE: When installing hub/bearing with ABS brakes, position the speed sensor opening towards the front of the vehicle.

CAUTION: The ball joint stud tapers must be **CLEAN** and **DRY** before installing the knuckle. Clean the stud tapers with mineral spirits to remove dirt and grease.

(2) Install the knuckle onto the upper and lower ball joint.

(3) Install the upper and lower ball joint nuts. Tighten the upper ball joint nut to 81 N·m (60 ft. lbs.) and the lower ball joint nut to 183 N·m (135 ft. lbs.) then install cotter pins. Grease the lower ball joint.

(4) Remove the hydraulic jack from the lower suspension arm.

(5) Install the tie rod end and tighten the nut to 88 N·m (65 ft. lbs.). Install the cotter pin.

(6) Install the front driveshaft, refer to Group 3 Differential and Driveline.

(7) Install the ABS wheel speed sensor if equipped and brake shield, rotor and caliper. Refer to Group 5 Brakes.

(8) Install the wheel and tire assembly.

(9) Remove support and lower the vehicle.

LOWER SUSPENSION ARM

REMOVAL

(1) Raise and support the vehicle.

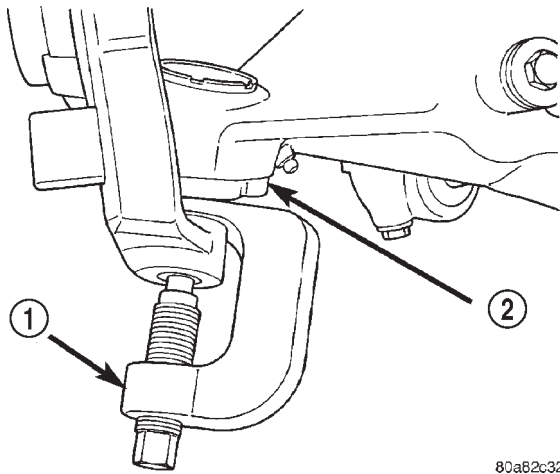
(2) Remove the wheel and tire assembly.

(3) Remove front driveshaft, refer to Group 3 Differential & Driveline.

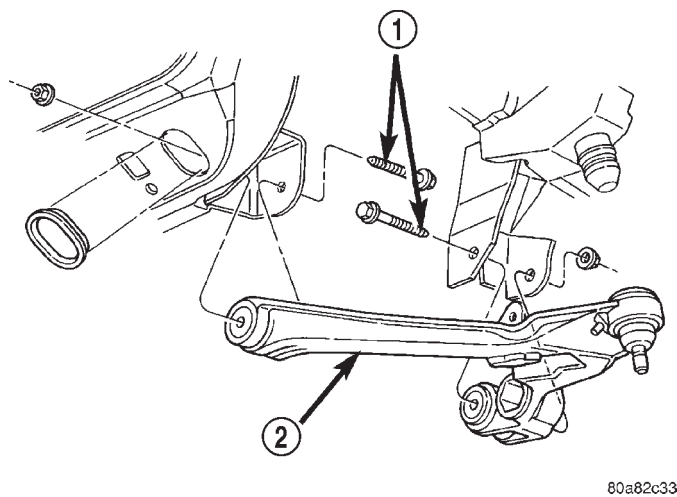
(4) Remove torsion bar.

REMOVAL AND INSTALLATION (Continued)

- (5) Remove shock absorber lower bolt.
- (6) Remove stabilizer bar.
- (7) Remove the cotter pin and nut from lower ball joint. Separate ball joint from the steering knuckle with Remover C-4150A (Fig. 9).
- (8) Remove suspension arm pivot bolts and suspension arm from frame rail brackets (Fig. 10).
- (9) Inspect lower ball joint seal and replace if damaged. Pry off old seal with screw driver if necessary.

**Fig. 9 Lower Ball Joint**

- 1 - REMOVER
2 - LOWER BALL STUD

**Fig. 10 Lower Suspension Arm**

- 1 - PIVOT BOLTS
2 - LOWER SUSPENSION ARM

INSTALLATION

- (1) Install new lower ball joint seal by tapping on around the seal flange lightly with a hammer.
- (2) Position the lower suspension arm at the frame rail brackets. Install the pivot bolts and nuts. Tighten the nuts finger-tight.

CAUTION: The ball joint stud taper must be **CLEAN** and **DRY** before installing the knuckle. Clean the stud taper with mineral spirits to remove dirt and grease.

- (3) Insert the ball joint into steering knuckle. Install and tighten the retaining nut to 183 N·m (135 ft. lbs.) and install a new cotter pin.
- (4) Install the torsion bar.
- (5) Install shock absorber lower bolt and tighten to 108 N·m (80 ft. lbs.).
- (6) Install the front driveshaft. Refer to Group 3 Differential & Driveline.
- (7) Install the wheel and tire assembly.
- (8) Remove support and lower the vehicle.
- (9) Install the stabilizer bar.
- (10) Tighten the lower suspension front pivot nut to 108 N·m (80 ft. lbs.). Tighten rear pivot bolt to 190 N·m (140 ft. lbs.).
- (11) Adjust the front suspension height.

UPPER SUSPENSION ARM**REMOVAL**

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake hose brackets from suspension arm, refer to Group 5 Brakes.
- (4) Position hydraulic jack under lower suspension arm and raise jack to unload rebound bumper.
- (5) Remove shock absorber.
- (6) Remove the cotter pin and nut from upper ball joint.
- (7) Separate upper ball joint from the steering knuckle with Remover MB-991113 (Fig. 11).

CAUTION: When installing Remover MB-991113 to separate the ball joint, be careful not to damage the ball joint seal.

- (8) Remove suspension arm pivot bar bolts and remove suspension arm (Fig. 12).

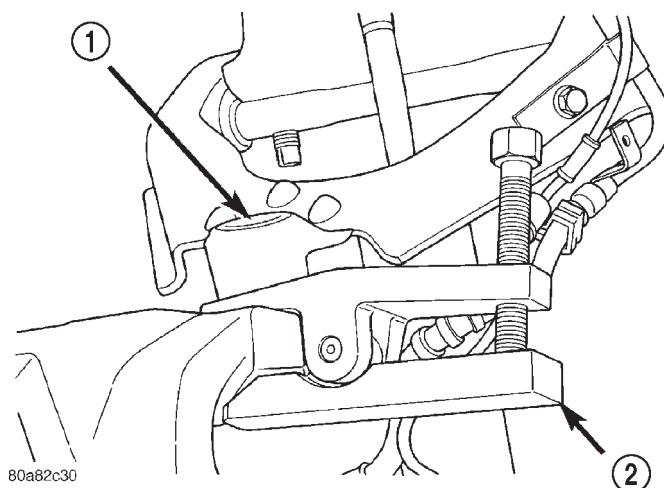
INSTALLATION

- (1) Position suspension arm pivot bar on mounting bracket. Install bolts and tighten (temporarily) to 136 N·m (100 ft. lbs.).
- (2) Insert ball joint in steering knuckle and tighten ball joint nut to 81 N·m (60 ft. lbs.) then install a new cotter pin.
- (3) Install shock absorber.

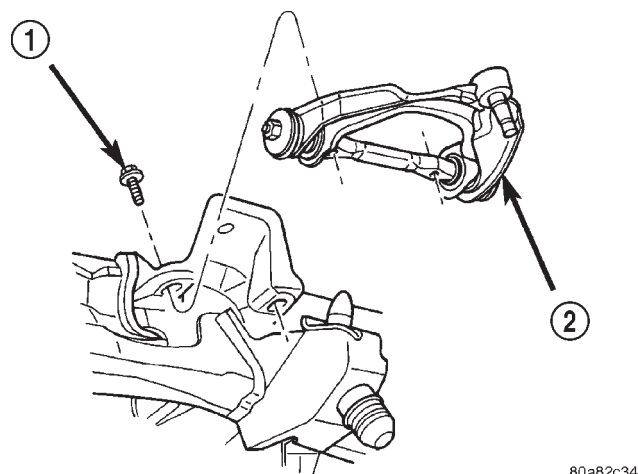
NOTE: Upper shock nut must be replaced or use Mopar Lock 'N Seal or Loctite® 242 on existing nut.

- (4) Remove hydraulic jack.

REMOVAL AND INSTALLATION (Continued)

**Fig. 11 Separate Upper Ball Joint**

- 1 - UPPER BALL STUD
2 - REMOVER

**Fig. 12 Upper Suspension Arm**

- 1 - PIVOT BAR BOLT
2 - UPPER SUSPENSION ARM

(5) Attach brake hose brackets to suspension arm, refer to Group 5 Brakes.

(6) Tighten upper suspension arm pivot bolts to 224 N·m (165 ft. lbs.).

(7) Install the wheel and tire assembly.

(8) Remove support and lower vehicle.

(9) Align front suspension.

STABILIZER BAR

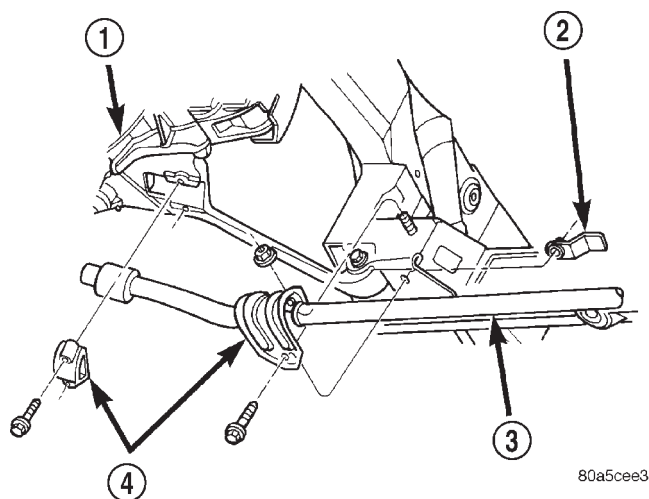
NOTE: To service the stabilizer bar the vehicle must be on a drive on hoist. The vehicle suspension must be at curb height for stabilizer bar installation.

REMOVAL

(1) Remove the stabilizer bar retainer bolts from the lower suspension arms (Fig. 13) and remove the retainers.

(2) Remove the stabilizer bar retainer nuts, bolts and retainers from the frame crossmember (Fig. 13) and remove the bar.

(3) If necessary, remove the bushings from the stabilizer bar.

**Fig. 13 Stabilizer Bar**

- 1 - LOWER SUSPENSION ARM
2 - FLAG NUT
3 - STABILIZER BAR
4 - RETAINER

INSTALLATION

(1) If removed, install the bushings on the stabilizer bar.

(2) Position the stabilizer bar on the frame crossmember brackets and install the retainers and nuts and bolts finger-tight (Fig. 13).

NOTE: Check the alignment of the bar to ensure there is no interference with the either frame rail or chassis component. Spacing should be equal on both sides.

(3) Install the stabilizer bar to the lower suspension arm.

(4) Install the retainers and bolts to the lower suspension arm and tighten to 34 N·m (25 ft. lbs.).

(5) Tighten the frame retainer nuts to 190 N·m (140 ft. lbs.).

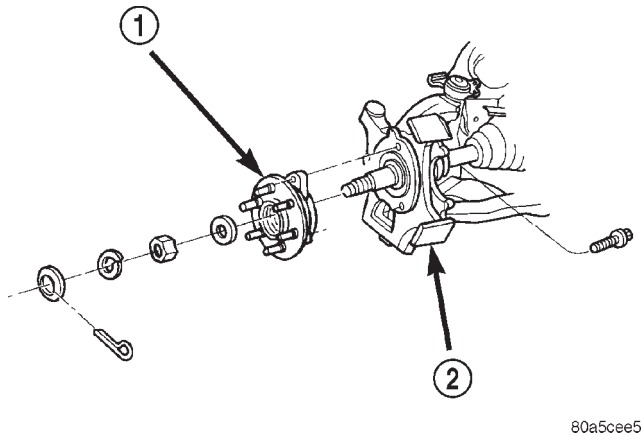
(6) Tighten the frame retainer bolts to 108 N·m (80 ft. lbs.).

REMOVAL AND INSTALLATION (Continued)

HUB/BEARING

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove axle nut.
- (4) Remove ABS wheel speed sensor if equipped, refer to Group 5 Brakes.
- (5) Remove the brake caliper and rotor, refer to Group 5 Brakes.
- (6) Remove hub/bearing mounting bolts from the steering knuckle (Fig. 14).
- (7) Slid hub/bearing out of the steering knuckle and off the axle.



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Fig. 14 Hub/Bearing

- 1 - HUB BEARING
2 - STEERING KNUCKLE

INSTALLATION

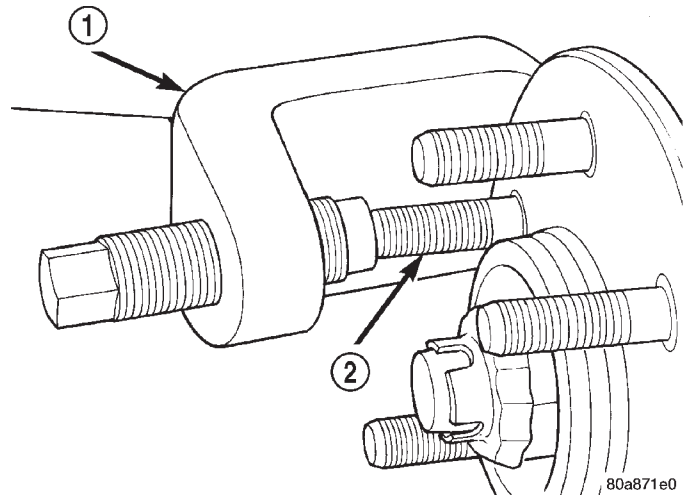
- (1) Install the hub/bearing into the steering knuckle and tighten the bolts to 166 N·m (123 ft. lbs.).
- (2) Install the brake rotor and caliper.
- (3) Install ABS wheel speed sensor if equipped.
- (4) Install axle nut and tighten to 235 N·m (173 ft. lbs.).
- (5) Install wheel and tire assembly.
- (6) Remove support and lower vehicle.

WHEEL MOUNTING STUDS

CAUTION: Do not use a hammer to remove wheel studs.

REMOVAL

- (1) Raise and support vehicle.
- (2) Remove wheel and tire assembly.
- (3) Remove brake caliper, caliper adapter and rotor, refer to Group 5 Brakes for procedure.
- (4) Remove stud from hub with Remover C-4150A (Fig. 15).



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Fig. 15 Wheel Stud Removal

- 1 - REMOVER
2 - WHEEL STUD

INSTALLATION

- (1) Install new stud into hub flange.
- (2) Install three washers onto stud, then install lug nut with the flat side of the nut against the washers.
- (3) Tighten lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.
- (4) Remove lug nut and washers.
- (5) Install the brake rotor, caliper adapter, and caliper, refer to Group 5 Brakes for procedure.
- (6) Install wheel and tire assembly, use new lug nut on stud or studs that were replaced.
- (7) Remove support and lower vehicle.

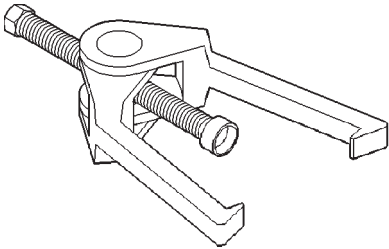
SPECIFICATIONS

TORQUE CHART

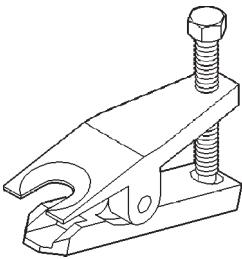
DESCRIPTION	TORQUE
Shock Absorber	
Upper Nut	26 N·m (19 ft. lbs.)
Lower Bolt	108 N·m (80 ft. lbs.)
Lower Suspension Arm	
Front Bolt	108 N·m (80 ft. lbs.)
Rear Bolt	190 N·m (140 ft. lbs.)
Ball Joint Nut	183 N·m (135 ft. lbs.)
Upper Suspension Arm	
Pivot Shaft Nuts	129 N·m (95 ft. lbs.)
Pivot Shaft to Frame Bolts .	224 N·m (165 ft. lbs.)
Ball Joint Nut	81 N·m (60 ft. lbs.)
Stabilizer Bar	
Frame Retainer Bolt	108 N·m (80 ft. lbs.)
Frame Retainer Nut	190 N·m (140 ft. lbs.)
Control Arm Retainer Bolts . .	34 N·m (25 ft. lbs.)
Hub/Bearing	
Bolts	166 N·m (123 ft. lbs.)

SPECIAL TOOLS

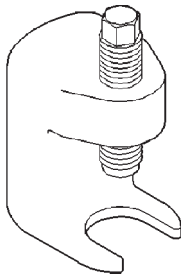
FRONT SUSPENSION



Puller Tie Rod C-3894-A



Remover MB-991113



Remover C-4150A

REAR SUSPENSION

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DESCRIPTION AND OPERATION

REAR SUSPENSION

DESCRIPTION

The rear suspension is comprised of:

- Drive Axle
- Shock Absorbers
- Stabilizer Bar (optional)
- Leaf Springs

CAUTION: A vehicle should always be loaded so the vehicle weight center-line is located immediately forward of the rear axle. Correct vehicle loading provides proper front tire-to-road contact. This results in maximum vehicle handling stability and safety. Incorrect vehicle weight distribution can cause excessive tire tread wear, spring fatigue or failure, and erratic steering.

CAUTION: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. This will maintain vehicle ride comfort and prevent premature bushing wear.

SHOCK ABSORBERS

DESCRIPTION

The top of the shock absorbers are bolted to the body crossmember. The bottom of the shocks are bolted to the axle brackets. The axle brackets are staggered one ahead of the axle and one behind.

OPERATION

Ride control is accomplished through the use of dual-action shock absorbers. The shocks dampen the jounce and rebound as the vehicle travels over various road conditions.

STABILIZER BAR

DESCRIPTION

The stabilizer bar (optional) extends across the underside of the vehicle and is bolted to the top of the axle. Links at the end of the bar are bolted to frame brackets.

OPERATION

The stabilizer bar is used to minimize vehicle body roll. The spring steel bar helps to control the vehicle body in relationship to the suspension.

LEAF SPRINGS

DESCRIPTION

The 4x2 rear suspension system uses a 4-leaf two stage or 5-leaf single stage springs and a solid drive axle. The 4x4 rear suspension system uses only a 4-leaf two stage spring and solid drive axle. The forward end of the springs are mounted to the body rail hangers through rubber bushings. The rearward end of the springs are attached to the body by the use of shackles. The spring and shackles use rubber bushings. The bushing help to isolate road noise.

OPERATION

The springs control ride quality and maintain vehicle ride height. The shackles allow the springs to change their length as the vehicle moves over various road conditions.

DIAGNOSIS AND TESTING

SPRING AND SHOCK

A knocking or rattling noise from a shock absorber may be caused by movement between mounting bushings and metal brackets or attaching components. These noises can usually be stopped by tightening the attaching nuts. If the noise persists, inspect for damaged and worn bushings, and attaching components. Repair as necessary if any of these conditions exist.

A squeaking noise from the shock absorber may be caused by the hydraulic valving and may be intermittent. This condition is not repairable and the shock absorber must be replaced.

The shock absorbers are not refillable or adjustable. If a malfunction occurs, the shock absorber

must be replaced. To test a shock absorber, hold it in an upright position and force the piston in and out of the cylinder four or five times. The action throughout each stroke should be smooth and even.

The spring eye and shock absorber bushings do not require any type of lubrication. Do not attempt to stop spring bushing noise by lubricating them. Grease and mineral oil-base lubricants will deteriorate the bushing rubber.

If the vehicle is used for severe, off-road operation, the springs should be examined periodically. Check for broken and shifted leaves, loose and missing clips, and broken center bolts. Refer to Spring and Shock Absorber Diagnosis chart for additional information.

SPRING AND SHOCK ABSORBER

CONDITION	POSSIBLE CAUSES	CORRECTION
SPRING SAGS	1. Broken leaf. 2. Spring fatigue.	1. Replace spring. 2. Replace spring.
SPRING NOISE	1. Loose spring clamp bolts. 2. Worn bushings. 3. Worn or missing spring tip inserts.	1. Tighten to specification. 2. Replace bushings. 3. Replace spring tip inserts.
SHOCK NOISE	1. Loose mounting fastener. 2. Worn bushings. 3. Leaking shock.	1. Tighten to specification. 2. Replace shock. 3. Replace shock.

REMOVAL AND INSTALLATION

SHOCK ABSORBER

REMOVAL

- (1) Raise vehicle and support rear axle.
- (2) Remove shock absorber lower nut and bolt from the axle bracket (Fig. 1).
- (3) Remove shock absorber upper nut and bolt from the frame bracket and remove the shock absorber.

INSTALLATION

- (1) Install shock absorber and upper mounting bolt and nut. Tighten nut to 95 N·m (70 ft. lbs.).
- (2) Install shock absorber into the axle bracket. Install the bolt and nut and tighten nut to 95 N·m (70 ft. lbs.).
- (3) Remove axle support and lower vehicle.

STABILIZER BAR

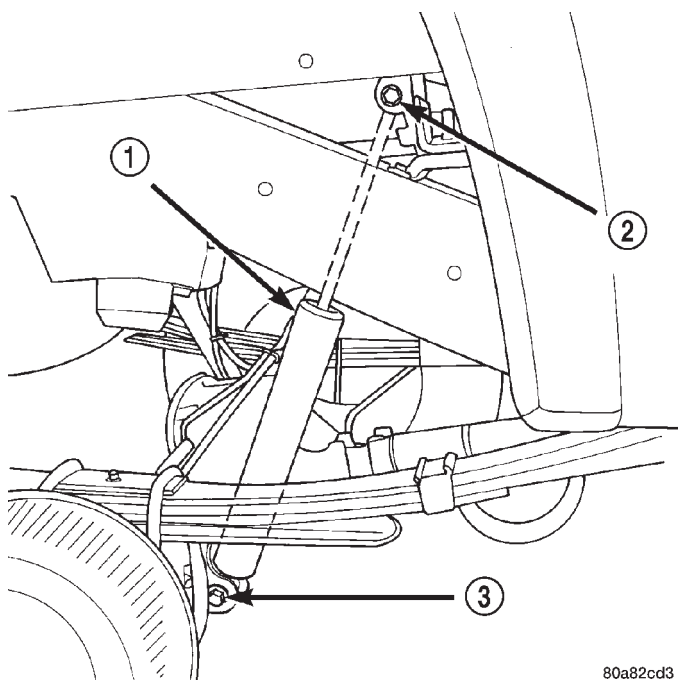
REMOVAL

- (1) Raise and support vehicle.
- (2) Remove nuts and bolts from the links at the stabilizer bar.
- (3) Remove stabilizer bar retainer bolts and retainers (Fig. 2).
- (4) Remove stabilizer bar and replace worn, cracked or distorted bushings.
- (5) Remove links upper mounting nuts and bolts and remove links.

INSTALLATION

- (1) Install the stabilizer bar and center it with equal spacing on both sides. Install stabilizer bar retainers and tighten bolts to 54 N·m (40 ft. lbs.).
- (2) Install link into frame brackets and the stabilizer bar. Install mounting nuts and bolts.
- (3) Remove support and lower vehicle.

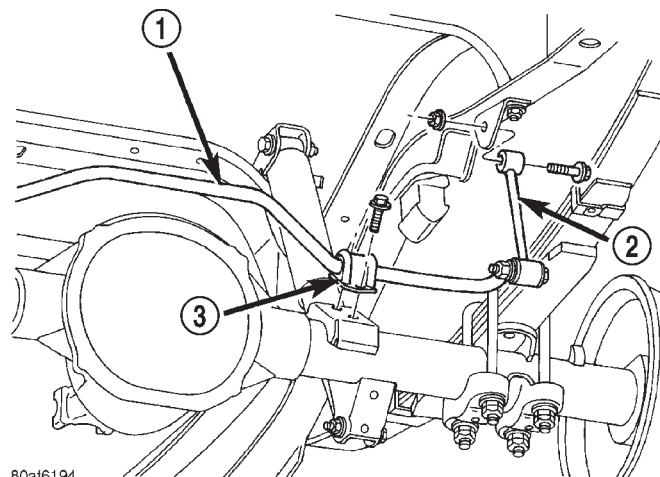
REMOVAL AND INSTALLATION (Continued)



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Fig. 1 Shock Absorber

- 1 - SHOCK ABSORBER
2 - MOUNTING BOLT
3 - MOUNTING BOLT



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Fig. 2 Stabilizer Bar Mounting

- 1 - STABILIZER BAR
2 - LINK
3 - RETAINER

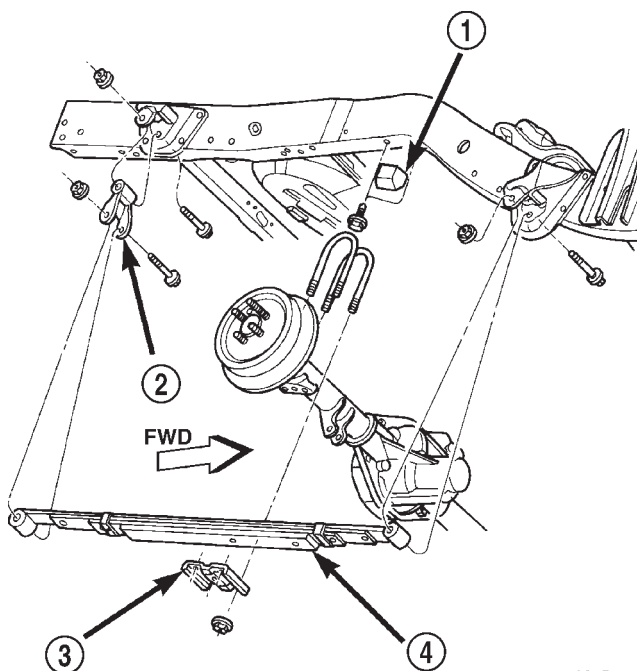
(4) Tighten stabilizer link nuts to 54 N·m (40 ft. lbs.).

LEAF SPRINGS

CAUTION: The rear of the vehicle must be lifted only with a jack or hoist. The lift must be placed under the frame rail crossmember located aft of the rear axle. Use care to avoid bending the side rail flange.

REMOVAL

- (1) Raise the vehicle at the frame.
- (2) Use a hydraulic jack to relieve the axle weight.
- (3) Remove the wheel and tire assemblies.
- (4) Remove the nuts, the U-bolts and spring plate from the axle (Fig. 3) and (Fig. 4).
- (5) Remove the nut and bolt from the spring front eye.
- (6) Remove the nut and bolt that attaches the spring shackle to the rear frame bracket.
- (7) Remove the spring from the vehicle.
- (8) Remove the shackle from the spring.



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Fig. 3 Leaf Spring - 4x2

- 1 - JOUNCE BUMPER
2 - SHACKLE
3 - PLATE
4 - LEAF SPRING

REMOVAL AND INSTALLATION (Continued)

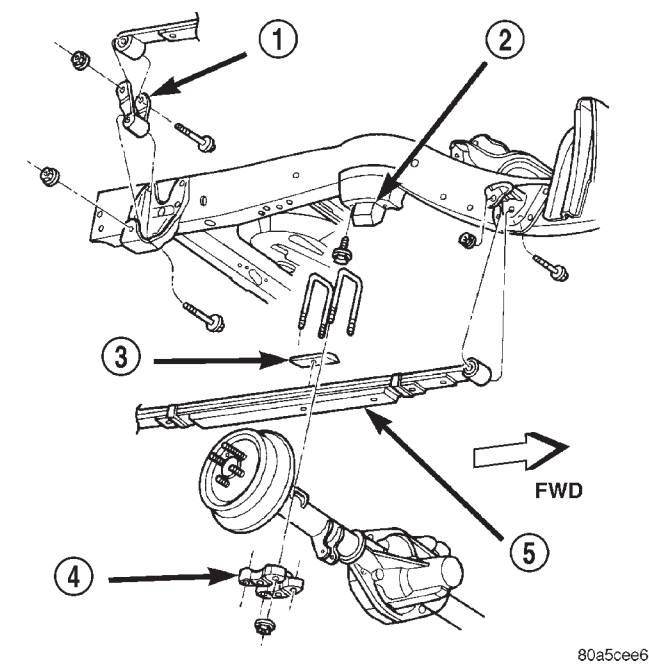


Fig. 4 Leaf Spring - 4x4

- 1 - SHACKLE
- 2 - JOUNCE BUMPER
- 3 - SEAT
- 4 - PLATE
- 5 - LEAF SPRING

INSTALLATION

- (1) Install the spring shackle on the spring finger tight.
- (2) Position the spring on the rear axle pad. Make sure the spring center bolt is inserted in the pad locating hole.
- (3) Align front spring eye with the bolt hole in the front frame bracket. Install the spring eye bolt and nut and tighten the spring eye nut finger-tight.

- (4) Align spring shackle eye with the bolt hole in the rear frame bracket. Install the bolt and nut and tighten the spring shackle eye nut finger-tight.
- (5) Install the spring seat (4x4 only), U-bolts, spring plate and nuts.
- (6) Tighten the U-bolt nuts to 149 N·m (110 ft. lbs.).
- (7) Install the wheel and tire assemblies.
- (8) Remove the support stands from under the frame rails. Lower the vehicle until the springs are supporting the weight of the vehicle.
- (9) Tighten the spring eye pivot bolt nut and all shackle nuts to 163 N·m (120 ft. lbs.).

SPECIFICATIONS

TORQUE CHART

DESCRIPTION	TORQUE
Shock Absorber	
Lower Bolt	95 N·m (70 ft. lbs.)
Upper Bolt	95 N·m (70 ft. lbs.)
Stabilizer Bar	
Frame Bracket Nuts	54 N·m (40 ft. lbs.)
Link Nuts	54 N·m (40 ft. lbs.)
Retainer Bolts	54 N·m (40 ft. lbs.)
Spring U-Bolt Nuts	
2WD	149 N·m (110 ft. lbs.)
4WD	149 N·m (110 ft. lbs.)
Spring	
Spring Eye Nut	163 N·m (120 ft. lbs.)
Spring Shackle Nuts	163 N·m (120 ft. lbs.)
Jounce Bumper	
Bolts	61 N·m (45 ft. lbs.)